ASOS MODIFICATION NOTE 32 (for Electronics Technicians)
Engineering Division
W/OSO321:AJW

SUBJECT	:	Software Version 3.0 for Voice Processor Board 1A2A20
PURPOSE	:	To add Meteorological Aviation Report (METAR) vocabulary to ASOS.
EQUIPMENT AFFECTED	:	ASOS Acquisition Control Unit (AACU)
PARTS REQUIRED	:	Microcircuit P/N 62828-45010-1 Microcircuit P/N 62828-45011-1 Microcircuit P/N 62828-45012-1 Microcircuit P/N 62828-45013-1 Microcircuit P/N 62828-45014-1 Microcircuit P/N 62828-45015-1 Microcircuit P/N 62828-45016-1 Microcircuit P/N 62828-45017-1
MOD PROCUREMENT:		The above parts are available through NLSC. Technicians should order one set of voice EPROMS, S100-1A2A20-U11A for each site listed in Appendix D. Return old EPROMS to NRC.
SPECIAL TOOLS REQUIRED	:	IC insertion tool Small flat-tipped screwdriver Conductive foam Electrostatic discharge (ESD) straps
TIME REQUIRED	:	1 hour
EFFECT ON OTHER INSTRUCTIONS	:	EHB-11, Section 3.6, Modification Note 31 must be installed in conjunction with this modification. This Modification Note supersedes Modification Note 14, and Modification Note 20.
AUTHORIZATION	:	This modification is authorized by ECP E95SM05F142.
VERIFICATION STATEMENT	:	This modification has been tested for operational integrity at the sites listed in Appendix B and the Engineering Design Branch laboratory.

GENERAL

This modification note provides instructions to upgrade the ASOS voice firmware by removing and replacing erasable programmable read only memory (EPROM) microcircuits. Before installing Modification Note 32, reference EHB-11, section 3.6, ASOS Modification Note 31.

PROCEDURE

The instructions for Engineering Modification 32 describes the installation of EPROMs U11, U12, U13, U14, U31, U32, U33, and U34 on the voice processor board 1A2A20.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194 and provide notification on which ASOS you will be installing new firmware. Confirm that the AOMC will provide access to the site-specific data base. Coordinate with the AOMC so the data base is available. Upload the current configuration before installing the new firmware.

2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month if restrictions in steps 3 and 4 are satisfied.

3. **Commissioned Sites Only**: Do not start installation during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of these conditions are expected within 3 hours. The responsible MIC/OIC will define these meteorological conditions.

4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 45 minutes should be sufficient, allow one hour to complete installation and restart ASOS.

5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/ Observer will inform the tower and any other critical users that ASOS will be shut off for firmware upgrade. At an unstaffed site, the el tech will inform the tower using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. Commissioned sites only, are to download the following data to the laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.

6. Do not begin the installation process, i.e., halt ASOS, until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.

7. Disable all hardwire and dial communication ports to AFOS (REVUE-SITE-CONFG-COMMS). Go into the AOMC page (REVUE-SITE-VERSN-AOMC); wait for the external communication and the site physical lines to change from "AUTO UPLOAD REQ" to

"COMPLETE" before going to the next step. The system voice function will automatically broadcast a "not available" message when the ACU power is turned off.

8. Make the appropriate SYSLOG entries (MAINT-ACT-FMK) Mod 32:
   1. Log on as **TECH**.
   2. Key the **MAINT** screen.
   3. Key the **ACT** page.
   4. Key **START** - Stop here and preform Mod 32.
      Upon completion of the Mod 32, log onto the system.

9. Continue with Appendix A, Instructions for ACU voice processor board firmware version upgrade. Once the steps in Appendix A have been completed, continue with "After Installing Firmware," step 10.

AFTER INSTALLING FIRMWARE

See step 12, page 4 for a description of the time required to reboot ASOS and sensor response time after a new firmware load.

10. When ASOS is restarted at unstaffed sites, call to inform towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC/Observer will call the tower.)

11. If on-site NWS staff provides backup while the installation is underway, no special observation is needed when ASOS is restarted. Proceed to step 12.

    If there is no backup at a site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The el tech should take the following steps at the ASOS keyboard after installation:
    1. Press [SIGN].
    2. Type his/her initials and press [RETURN].
    3. Type the observer level password and press [RETURN].
    4. Press [GENOB].
    5. Press [SPECL].
    6. Press [EXIT].
    7. Press [SIGN].
    8. Type his/her initials again and press [RETURN].
    9. Press [RETURN] twice. This signs the "observer" off ASOS.
    10. Leave ASOS running.

    Note: The "observer" must sign off before the 5-minute edit time is up.

12. Inform the office staff that ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. It might

also be necessary to augment several elements or even the entire observation. The chart below indicates how long it takes after a start up for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

	Minimum	Maximum
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

* Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

13. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
    1. Your location.
    2. That installation of the new firmware has been completed.
    3. That ASOS is operational.

14. Enter in the SYSLOG that maintenance has been completed.
    1. Key the **MAINT** screen.
    2. Key the **ACT** page.
    3. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Mod 32**
       On the second line of the screen verify that only Mod 32 is displayed. Complete by entering **Y** in the Y/N if only Mod 32 is displayed. If Mod 31 was completed, make appropriate log entries.
    4. Check the **SYSLOG** and verify the **FMK** message. Notify the AOMC via telephone that Mod 32 and any other Mods that have been completed.

15. At an expansion site with ATCT, the el tech will contact the ATCT and supply information on the following:

    1. ASOS maintenance is completed.
    2. ASOS is restored to service.
    3. Tower CVDs and OIDs need to be turned on, and TRACON displays need to be turned on.

REPORTING MODIFICATION

Target date for completion of this modification is 30 days after receipt of parts. Report completed modification on a Weather Service Form A-26 maintenance record, per instructions in EHB-4, Part 2, Appendix F, using reporting code AACU. If this modification is installed in conjunction with Modification Note 31, a separate Weather Service Form A-26 must be completed for each modification note.

Also, record the modification number in block 17(a) as 32 (see appendix C for a completed sample of WS Form A-26).

NOTE:
Parts removed (EPROMs) should be returned to NRC as S100-FMK015D.OLD. NRC will be reprogramming the EPROMs for other ASOS applications.

Acting Chief, Engineering Division

Appendix A
Appendix B
Appendix C
Appendix D

W/OSO321:AJWissman:713-1835x165:2/5/96:sol:EHBdisk, MOD32.H11
rev.2/6/96:solSpellchecked: 2/5/96 sol:also on EHB-11 disk

APPENDIX A

INSTRUCTIONS
FIELD MODIFICATION KIT - ACU VOICE PROCESSOR BOARD
FIRMWARE VERSION UPGRADE

1. UPGRADING ACU VOICE PROCESSOR BOARD FIRMWARE

1.1 GENERAL

Digital voice processing consists of three operations: producing a verbal report based on current ASOS data from a stored vocabulary, recording an operator-generated addendum up to 90 seconds long, and producing an output consisting of the automatically generated data and the operator input. Outputs are available for the FAA handset, dial-up reports, and FAA radio communications for aircraft. Voice processing is accomplished with two dedicated boards: a Voice Processor board and a Voice Recorder/Playback board. The Voice Processor board contains the CPU for the digital voice system. It receives digital voice files from the ASOS CPU, creates voice reports consistent with the data reported by the sensors, and receives operator-generated digitized audio from the Voice Recorder/Playback board. The Voice Recorder/Playback board receives digitized voice from the Voice Processor board and converts the data into audio. Audio is output for dial-in weather requests, for the FAA handset at OID port 5C, and to an FAA transmitter for pilot use. In addition, the Voice Recorder/Playback board receives input voice audio from the FAA handset, digitizes the input audio, and transfers the digitized audio to the Voice Processor board for storage in random access memory (RAM).

1.2 FIRMWARE UPGRADE PROCEDURE

The procedure to upgrade the ACU voice firmware by removing and replacing the eight EPROMs on the Voice Processor board is followed. See Figure 1.

REMOVAL

Step

1. Set OUTPUT POWER switch on UPS status panel to 0 (**OFF**) position. Output indicator on status panel extinguishes.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (**OFF**) position and that facility power is removed.

To avoid damage to circuit boards, use proper electrostatic discharge (ESD) handling procedures, including the use of a grounding strap, when performing the following steps.

2. Remove facility power from ACU cabinet.

3. Using ASOS Site Maintenance Manual, locate circuit board to be removed.

4. When removing Voice Processor Board 1A2A20, disconnect cable from front of board by exerting outward force on cable release tabs at top and bottom of connector.

5. Using small flat-tipped screwdriver, loosen captive screws at top and bottom of board.

6. If board is equipped with extractor handles, press handles in opposite directions to release board. If board does not have extractor handles, gently rock board while exerting outward pressure and remove board from rack.

CAUTION

Throughout this procedure, discharge screwdriver before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

Lift integrated circuit as evenly as possible. Failure to comply may result in damage to integrated circuits.

7. From the front of board, slide small flat-tipped screwdriver between integrated circuit U11 and its IC socket. Carefully pry up on U11 to lift it from socket as evenly as possible. Remove U11 from socket and place in conductive foam or on another static-free surface.

8. Repeat step 7 for integrated circuits U12, U13, U14, U31, U32, U33, and U34.

INSTALLATION

Step

1. Verify that OUTPUT POWER switch on UPS status panel is set to 0 **(OFF)** position and OUTPUT indicator on status panel is extinguished.

CAUTION

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (**OFF**) position and facility power is removed.

To avoid damage to circuit boards, use proper ESD handling procedures, including the use of a ground strap, when performing the following steps.

2. Verify that facility power is removed from ACU cabinet.

CAUTION

Throughout this procedure, discharge IC insertion tool before and during use by touching tool to grounded chassis surface. Failure to comply may result in damage to integrated circuits.

3. Using IC insertion tool, remove new EPROM integrated circuits from protective packaging and insert into Voice Processor board IC sockets in accordance with the following chart. Ensure that EPROMs are installed with pin 1 (as identified by notch in top of IC) oriented toward top of Voice Processor board as shown on Figure 1.

IC socket	IC Part number
U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1

4. Holding board by handles, position board with component side to right and carefully slide board into card rack on its guides. Align board with rear connector and press into place.

Using small flat-tipped screwdriver, tighten captive screws at top and bottom of board.

When installing Voice Processor board 1A2A20, connect cable attached to the front of board as follows:

a. Position connector extraction tabs to their fully extended position.

b. Locate cable keys and position keys to right; install cable in connector.

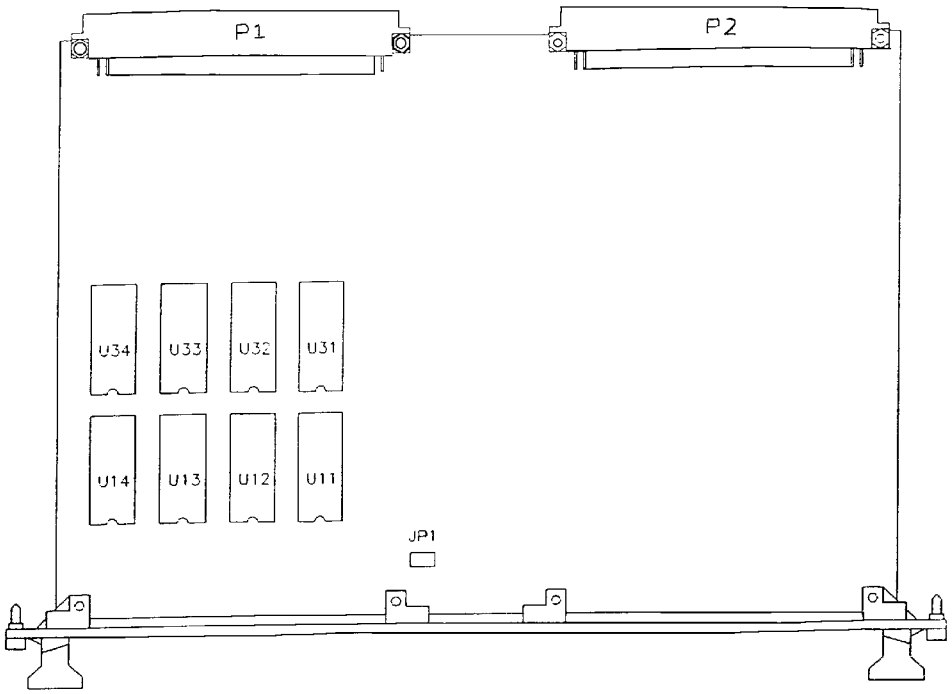
5. This completes Modification Note 32. Modification Note 31 must be completed in conjunction with this note before going to step 6.

6. Apply facility power to ACU cabinet.

7. Set OUTPUT POWER switch to 1 (**ON**) position.

This completes the installation.

FIGURE 1



VOICE PROCESSOR BOARD 1A2A20

ASSY 62828-47018-10

ALL COMPONENTS NOT SHOWN

IC socket	IC part number
U11	62828-45010-1
U12	62828-45011-1
U13	62828-45012-1
U14	62828-45013-1
U31	62828-45014-1
U32	62828-45015-1
U33	62828-45016-1
U34	62828-45017-1

The test sites for version 3.0 are:

NWS Eastern Region

BOS - Boston Logan, MA
CON - Concord, NH
PWM - Portland, ME
TAN - Taunton, MA

NWS Southern Region

AHN - Athens, GA
3R5 - New Braunfels, TX

NWS Central Region

BIS - Bismarck, ND
GTJ - Grand Junction, CO
LBF - North Platte, NE
STP - St. Paul, MN

NWS Western Region

BNO - Burns, OR

NWS Alaska Region

ANC - Anchorage, AK

APPENDIX C

INFORMATION TO BE PROVIDED BY CM

SITES REQUIRING VERSION 3.0

This firmware is reserved for National Weather Service sites ONLY. FAA expansion sites will continue to use firmware version 2.0. The following sites are commissioned NWS sites that require the installation of firmware version 3.0. Sites soon to be commissioned also require version 3.0.

Eastern Region

ILG	WILMINGTON	DE
ORH	WORCESTER	MA
PWM	PORTLAND	ME
GSO	GREENSBORO	NC
HSE	HATTERAS	NC
ILM	WILMINGTON	NC
RDU	RALEIGH/DURHAM	NC
ACY	ATLANTIC CITY	NJ
ALB	ALBANY	NY
BGM	BINGHAMTON	NY
BUF	BUFFALO	NY
NYC	CENTRAL PARK	NY
SYR	SYRACUSE	NY

CAK	AKRON	OH
CLE	CLEVELAND	OH
DAY	DAYTON	OH
MFD	MANSFIELD	OH
TOL	TOLEDO	OH
YNG	YOUNGSTOWN	OH
ABE	ALLENTOWN	PA
ERI	ERIE	PA
IPT	WILLIAMSPORT	PA
PHL	PHILADELPHIA	PA
PVD	PROVIDENCE	RI
CAE	COLUMBIA	SC
CHS	CHARLESTON	SC
RIC	RICHMOND	VA
BTV	BURLINGTON	VT
BKW	BECKLEY	WV
CRW	CHARLESTON	WV

Southern Region

HSV	HUNTSVILLE	AL
MGM	MONTGOMERY	AL
MOB	MOBILE	AL
FSM	FORT SMITH	AR
DAB	DAYTONA BEACH	FL

PBI	WEST PALM BEACH	FL
TPA	TAMPA	FL
AHN	ATHENS	GA

ATL	ATLANTA	GA
CSG	COLUMBUS	GA
AGS	AUGUSTA	GA
MCN	MACON	GA
BTR	BATON ROUGE	LA
LCH	LAKE CHARLES	LA
SHV	SHREVEPORT	LA
JAN	JACKSON	MS
MEI	MERIDIAN	MS
TUP	TUPELO	MS
TUL	TULSA	OK
CHA	CHATTANOOGA	TN
TRI	BRISTOL TN	
TYS	KNOXVILLE	TN

ACT	WACO	TX
AMA	AMARILLO	TX
AUS	AUSTIN	TX
BPT	BEAUMONT	TX
BRO	BROWNSVILLE	TX
CRP	CORPUS CHRISTI	TX
DFW	DALLAS / FT WORTH	TX
ELP	EL PASO	TX
LBB	LUBBOCK	TX
SAT	SAN ANTONIO	TX
SJT	SAN ANGELO	TX
SPS	WICHITA FALLS	TX
VCT	VICTORIA	TX

Central Region

ALS	ALAMOSA	CO
COS	COLORADO SPRINGS	CO
DEN	DENVER	CO
LIC	LIMON	CO
PUB	PUEBLO	CO
MLI	MOLINE	IL
ORD	CHICAGO	IL
PIA	PEORIA	IL
RFD	ROCKFORD	IL
SPI	SPRINGFIELD	IL
EVV	EVANSVILLE	IN
IND	INDIANAPOLIS	IN
CNK	CONCORDIA	KS
DDC	DODGE CITY	KS
GLD	GOODLAND	KS
ICT	WICHITA	KS
TOP	TOPEKA	KS
CVG	COVINGTON	KY
JKL	JACKSON	KY

PAH	PADUCAH	KY
SDF	LOUISVILLE	KY
DBQ	DUBUQUE	IA
DSM	DES MOINES	IA
SUX	SIOUX CITY	IA
DTW	DETROIT	MI
FNT	FLINT	MI
GRR	GRAND RAPIDS	MI
STC	ST CLOUD	MN
COU	COLUMBIA	MO
MCI	KANSAS CITY	MO
SGF	SPRINGFIELD	MO
FAR	FARGO	ND
BFF	SCOTTSBLUFF	NE
GRI	GRAND ISLAND	NE
LBF	NORTH PLATTE	NE
LNK	LINCOLN	NE

VTN	VALENTINE	NE
ABR	ABERDEEN	SD
RAP	RAPID CITY	SD
MKE	MILWAUKEE	WI
CYS	CHEYENNE	WY
RIW	RIVERTON	WY

Western Region

FLG	FLAGSTAFF	AZ
IGM	KINGMAN	AZ
INW	WINSLOW	AZ
PHX	PHOENIX	AZ
TUS	TUSCON	AZ
BIH	BISHOP	CA
BLU	EMIGRANT GAP	CA
FAT	FRESNO	CA
RBL	RED BLUFF	CA
BOI	BOISE	ID
LWS	LEWISTON	ID
BIL	BILLINGS	MT
FCA	KALISPELL	MT
GGW	GLASGOW	MT
GTF	GREAT FALLS	MT
HLN	HELENA	MT
HVR	HAVRE	MT
ELY	ELY	NV
LAS	LAS VEGAS	NV
RNO	RENO	NV
WMC	WINNEMUCA	NV
AST	ASTORIA	OR
BNO	BURNS	OR
EUG	EUGENE	OR
PDT	PENDLETON	OR
PDX	PORTLAND	OR
SLE	SALEM	OR
SXT	SEXTON SUMMIT	OR
GEG	SPOKANE	WA
OLM	OLYMPIA	WA
SMP	STAMPEDE PASS	WA